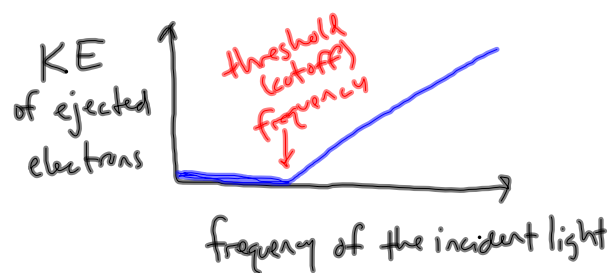


## Photoelectric Effect:



$$K = mf + b$$

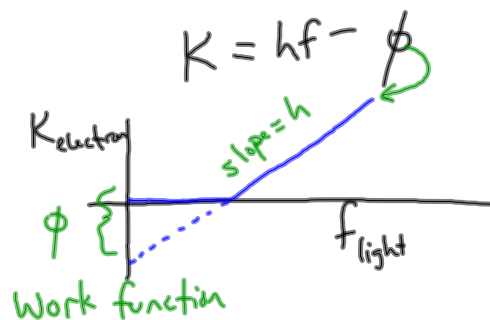
Einstein's interpretation of the photoelectric effect:

- Electrons have total energy of  $-\phi$ .
- If they can gain energy  $= +\phi$ , then they can leave the atom.

$$\begin{aligned} E_{\text{before}} &= E_{\text{light}} + E_{\text{electron}} \\ &= hf - \phi \end{aligned}$$

$$E_{\text{after}} = E_{\text{electron}} = K$$

- Using conservation of energy,



- Roentgen  $\rightarrow$  first x-ray production  
in 1895

- Wave-Particle duality:

- If light can be thought of  
as both, why not particles?

- Davisson-Germer did an exp.  
that showed electrons  
had interference pattern when  
traveling through a crystal lattice

- They concluded that electrons  
can act as waves.

- Next logical step is that all  
particles can act as waves.

- Louis de Broglie

$$p = mv = \frac{h}{\lambda}$$

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- Electron-Volt

- energy system gains or loses  
when charge of magnitude  
 $e$  moved through potential  
difference of  $1\text{ V}$